

ABSTRACT

The invention provides compositions and methods for performing primer extension reactions, including employment of amplification primers having 5' tags to incorporate into amplicons variant nucleotides of interest from target nucleic acids at known ratios, with or without sequences surrounding the variant nucleotides of interest. The invention provides identifying the variant nucleotides generated from the target nucleic acid and generated from the 5' tags, comparing the results, evaluating the efficiency of the primer extension reactions, and monitoring the efficacy of such reactions. The invention accounts for DNA sequence and experimental variables that may affect efficiency of incorporation of nucleotides, and provides a reference point for the interpretation of polymorphisms. The invention also provides methods of breeding scrapie-resistant sheep populations.